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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/466,174	12/17/1999	HIDENORI KAWANISHI	0717-0429P	9854

7590

03/11/2003

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EXAMINER

MENEFEE, JAMES A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/466,174

Applicant(s)

KAWANISHI ET AL.

Examiner

James A. Menefee

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Paul IP

PAUL IP

SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

In response to the Amendment filed 16 December 2002, claims 1, 2 and 4-8 are cancelled, and claims 16-42 added. Claims 16-42 are pending.

Terminal Disclaimer

The terminal disclaimer filed on 16 December 2002 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,163,631 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Paoli (previously cited US 5,228,049). Paoli discloses the claimed invention as follows, see especially Figs. 2 and 6:

Regarding claim 16, Paoli discloses a semiconductor laser device with a spot-size converter comprising a semiconductor substrate 20 having a semiconductor laser region 10 and a semiconductor layer 10' thereon, the semiconductor laser region 10 and the semiconductor layer

Art Unit: 2828

10' being integrally formed as one unit on the substrate 20 in a lateral direction to emit light from the side of the semiconductor layer 10'. The refractive index of the semiconductor layer 10' varies in a layer direction.

Regarding claim 17, the semiconductor layer is made of different materials (see Fig. 3A) and thus the refractive index will vary in a continuous or stepwise manner having a graded index.

Regarding claim 18, the claim is only functional language and defines no structure. Functional language may not be used to distinguish a claim from the prior art, and thus the claim is not distinguished from claim 17.

Regarding claims 19-21, Paoli discloses that the semiconductor layer 10' is formed such that the region having the highest refractive index is substantially consistent with a central portion of light distribution emitting from the semiconductor laser region 10.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paoli in view of Andrews (previously cited US 5,175,643). Paoli discloses the limitations of claims 16-21 as shown above, but does not disclose that either another semiconductor layer or a dielectric layer is formed on the boundary between the laser region and the semiconductor layer. Paoli does disclose a boundary layer 33 between these two regions without specifying what type of layer it

Art Unit: 2828

is. The boundary layer is for separating the contacts of the two regions so that the regions may be individually biased (col. 4 lines 35-39). Andrews teaches an integrated laser amplifier structure similar to Paoli where there is a boundary 54 that may be a dielectric layer or a proton implanted semiconductor layer (col. 4 line 53 – col. 5 line 4). It would have been obvious to one skilled in the art to use a semiconductor layer or a dielectric layer as the boundary layer 33 of Paoli, as taught by Andrews, because it will perform the stated function of the boundary layer 33, as taught by Andrews. While it is not explicitly disclosed that the another semiconductor layer have a constant refractive index, it is inherent that this will be the case so that the boundary layer does not interfere with the other layers of the laser.

Regarding claims 30-31, the semiconductor layer 10' can be interpreted as the waveguide of these claims, thus the claims are taught as above in combination with Andrews where the substrate and laser regions are the same, the light waveguide region is 10', and the boundary region 33 being the dielectric or semiconductor layer buried at the joint region as appropriate.

Regarding claim 32, when the semiconductor layer is buried at the joint region, it is inherent that the boundary may have a constant refractive index as shown in the above rejection of claims 22-29.

Claims 31 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paoli in view of Sanders et al (previously cited US 5,912,910).

Regarding claim 31, Paoli discloses a semiconductor laser device with a spot-size converter comprising a semiconductor substrate 20 having a semiconductor laser region 10 thereon. It is not disclosed that that the device further comprises a light waveguide region at an

Art Unit: 2828

opposite side of the laser region and facing the semiconductor layer. Sanders teaches in figure 8 and the discussion thereof a MOPA where the output is coupled into a waveguide. It would have been obvious to one skilled in the art to include a waveguide region at the opposite side of the laser region and facing the semiconductor region in the device of Paoli, as taught by Sanders, as this waveguide can be an oscillator causing the propagation of light, as taught by Sanders. In this configuration, at the joint region between the light waveguide region and the laser region, the semiconductor layer 10' is buried.

Regarding claims 33-34, the limitations are disclosed as in the rejection of claims 17 and 19.

Claims 35-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paoli and Sanders as applied to claims 31 and 33-34 above, and further in view of Andrews. Paoli and Sanders do not disclose the semiconductor layer of dielectric layer formed at the boundary region, but this is taught by Andrews with motivation as in the rejection of claims 22-32 above.

Response to Arguments

Applicant's arguments filed 16 December 2002 have been fully considered but they are not persuasive. Applicant makes the following arguments:

1. "With respect to independent claim 16, this claim includes, in combination, the structure of "the second layer region...semiconductor layer in the layer direction"...Paoli and Andrews do not show or suggest at least these features of claim 16." (p. 10 of response)

2. "Sanders fails to show the details of [sic] waveguide region in the context claimed." (p. 11).

It is believed that each of these arguments is disproved and the features of the claims are shown as in the above rejections.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the

Application/Control Number: 09/466,174

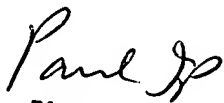
Page 7

Art Unit: 2828

organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
February 25, 2003


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